



7590-01-P

NUCLEAR REGULATORY COMMISSION

[Docket No. NRC-2018-0168]

Weld Residual Stress Finite Element Analysis Validation

AGENCY: Nuclear Regulatory Commission.

ACTION: Draft NUREG; request for comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is requesting public comment on a draft NUREG entitled, "Weld Residual Stress Finite Element Analysis Validation: Part II – Acceptance and Guidelines." This report proposes a methodology by which analysts can increase confidence in modeling capabilities for regulatory applications involving weld residual stress calculation. Specifically, the NRC staff posed four questions for consideration by the public (see Supplementary Information).

DATES: Submit comments by **[INSERT DATE 60 DAYS FROM DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practical to do so, but the Commission is able to ensure consideration only for comments received before this date.

ADDRESSES: You may submit comments by any of the following methods:

- *Federal Rulemaking Web Site:* Go to <http://www.regulations.gov> and search for Docket ID *NRC-2018-0168*. Address questions about NRC dockets in Regulations.gov to Jennifer Borges; telephone: 301-287-9127; e-mail: Jennifer.Borges@nrc.gov. For technical questions, contact the individual listed in the **FOR FURTHER INFORMATION CONTACT** section of this document.

- *Mail comments to:* May Ma, Office of Administration, Mail Stop: TWFN-7-A60M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

For additional direction on obtaining information and submitting comments, see “Obtaining Information and Submitting Comments” in the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: Michael Benson, Office of Nuclear Regulatory Research, telephone: 301-415-2425, e-mail: michael.benson@nrc.gov; or Patrick Raynaud, Office of Nuclear Regulatory Research, telephone: 301-415-1987, e-mail: patrick.raynaud@nrc.gov. Both are staff of the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

SUPPLEMENTARY INFORMATION:

I. Obtaining Information and Submitting Comments

A. Obtaining Information

Please refer to Docket ID *NRC-2018-0168* when contacting the NRC about the availability of information for this action. You may obtain publicly-available information related to this action by any of the following methods:

- *Federal Rulemaking Web Site:* Go to <http://www.regulations.gov> and search for Docket ID *NRC-2018-0168*.

- *NRC’s Agencywide Documents Access and Management System (ADAMS):* You may obtain publicly-available documents online in the ADAMS Public Documents collection at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select “[Begin Web-based ADAMS Search](#).” For problems with ADAMS, please contact the NRC’s Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The draft NUREG on “Weld Residual Stress

Validation” is available in ADAMS under Accession No. ML18242A007.

- *NRC’s PDR*: You may examine and purchase copies of public documents at the NRC’s PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

B. Submitting Comments

Please include Docket ID *NRC-2018-0168* in your comment submission.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at <http://www.regulations.gov> as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

II. Background

Between 2008-2015, the Electric Power Research Institute and the NRC conducted a joint research program on weld residual stress (WRS) modeling under a memorandum of understanding. This research program consisted of several modeling and measurement studies on prototypic mockups to represent the residual stress state in safety-related nuclear components susceptible to primary water stress corrosion cracking, see NUREG-2162 (ADAMS Accession No. ML14087A118). Since then, the

NRC has made use of the data gained in that research program to formulate a potential validation scheme for finite element modeling of WRS. The NRC's proposal is documented in a draft NUREG entitled, "Weld Residual Stress Finite Element Analysis Validation: Part II–Proposed Validation Procedure" (ADAMS Accession No. ML18242A007). The NRC is requesting public comment on this document. Specifically, the NRC would like feedback on four specific technical issues related to the proposed validation procedure:

1. The NRC recommended the use of the average hardening approach in the current version of the draft NUREG ("average hardening" meaning the arithmetic mean of isotropic and nonlinear kinematic results). Given the discussion in Section 5.2, please comment on the advantages and disadvantages of using either the averaging approach or isotropic hardening. What initial and recurring costs are foreseen in implementing either approach in future analyses?
2. The NRC introduced four options for benchmark in Section 5.4.2. The NRC chose to develop the validation scheme with a benchmark based upon the modeling results, rather than the measurements. Please comment on the NRC's proposal and whether the justification is adequate.
3. Please comment on the proposed quality metrics introduced in Section 5.4.7. Are these metrics appropriate for their intended purpose? Has the NRC presented an appropriate technical justification (see Sections 5.4.8 and 5.4.10) for the proposed metrics?

4. Please comment on the feasibility of the proposed validation scheme. What initial (e.g., software and guidance development) and recurring (i.e., costs for each analysis) costs are foreseen for implementing the validation scheme?

Dated at Rockville, Maryland, this 10th day of September, 2018.

For the Nuclear Regulatory Commission.

Raj Iyengar,
Chief,
Component Integrity Branch,
Division of Engineering,
Office of Nuclear Regulatory Research.

[FR Doc. 2018-19941 Filed: 9/12/2018 8:45 am; Publication Date: 9/13/2018]